

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of : Erik J. Shahoian et al
Application No. : 10/689,130
For : **System and Method for Providing Rotational Haptic Feedback**
Filed : October 20, 2003
Examiner : Steven E. Holton
Art Unit : 2629

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF

Sir:

This is an Appeal Brief filed under 37 C.F.R. § 41.37 in connection with the final rejection of claims 1-19 in the Final *Office Action* mailed May 17, 2007. Each of the topics required by 37 C.F.R. § 41.37 is presented herewith and labeled appropriately.

Real Party in Interest

The real party in interest in the present application is the assignee, Immersion Corporation, 801 Fox Lane, San Jose, California 95131 (hereinafter "Appellant").

Related Appeals and Interferences

Applicant knows of no other appeals or interferences related to the present application.

Status of Claims

Claims 1-19 stand finally rejected and are the substance of this appeal. The final rejection of claims 1-19 (shown in attached Appendix A) is appealed.

Status of Amendments

Applicant did not seek to amend the application after final rejection.

Summary of the Claimed Subject Matter

Claims 1, 14, and 17 are the pending independent claims.

Claim 1 recites a system that is generally useful for controlling a user interface via a touch-sensitive input device and providing rotational haptic feedback to the input device. *See Specification, Paragraph 23.* Claim 1 first recites “a touch-sensitive input device configured to move in a rotary degree of freedom.” In one described embodiment, the touch-sensitive device is a circular touchpad on a hand held MP3 player. *See Specification, Paragraphs 23, 24 and Fig. 1A.* The circular touchpad is configured to move or rotate slightly about a central axis. *See Specification, Paragraph 39.*

The system of claim 1 further comprises “an actuator configured to produce a rotational force on the touch-sensitive input device.” The actuator, such as a motor, is connected to the touchpad and provides force to cause the “touchpad to rotate slightly back and forth” to produce a haptic effect. *See Specification, Paragraphs 45 and 29.* For example, the rotation may be felt by the user as a real time haptic cue synchronized with display events, such as scrolling, on a user interface. *See Specification, Paragraph 42.*

Claim 14 recites a method that is generally useful for the same purpose as the system of claim 1. The method of claim 14 comprises “receiving an input signal, [and] generating an output signal in response to the input signal, the output signal configured to cause a rotational force on a touch-sensitive input device configured to move in a rotary degree of freedom.” In one described embodiment, a processor, executing computer-executable program instructions stored in memory, receives an input signal and, in response, generates an output signal configured to impart a haptic sensation on the input device, e.g., a hand held MP3 player. *See Specification, Paragraph 35.*

Claim 17 recites “a computer-readable medium on which is encoded processor-executable program code.” In one described embodiment, the computer-readable media stores instructions that, when executed by a processor, cause the processor to perform the steps described herein. *See Specification, Paragraph 28.*

Claim 17 comprises “program code for receiving an input signal.” The processor receives an input signal. *See Specification, Paragraph 35.*

Claim 17 further recites “program code for generating an output signal in response to the input signal, the output signal configured to cause a rotational force on a touch-sensitive input device configured to move in a rotary degree of freedom.” In one described embodiment, the processor receives an input signal and, in response, generates an output signal configured to impart a “pop” sensation on the input device. *See Specification, Paragraph 35.*

The above description of the claimed subject matter is intended to provide the reader with an overview of embodiments of the present invention, but is not intended to in any way limit the scope of the claimed invention.

Grounds of Rejection to be Reviewed on Appeal

The Examiner rejected claims 1-19 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Publication 2002/0033795 to Shahonian (hereinafter referred to as “Shahonian”) in view of U.S. Patent No. 6,128,006 to Rosenberg et al (hereinafter referred to as “Rosenberg”). The issue presented for consideration in this appeal is as follows:

1. Whether the Examiner erred in rejecting claims 1-19 under 35 U.S.C. § 103(a) as being unpatentable over Shahonian in view of Rosenberg.

Argument

Issue 1: Whether the Examiner erred in rejecting claims 1-19 under 35 U.S.C. § 103(a) as being unpatentable over Shahonian in view of Rosenberg.

The rejection of claims 1-19 under 35 U.S.C. § 103(a) as being unpatentable over Shahonian in view of Rosenberg should be reversed because the combined references do not teach or suggest each and every element of the claimed invention.

A claimed invention is not patentable as obvious over the prior art “if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” 35 U.S.C. § 103(a). To establish a prima facie case of obviousness, the prior art reference (or references when combined) must teach or suggest all the claim limitations. *Application of Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

In claims 1, 14 and 17, Applicant claims a system comprising, in part, “a touch-sensitive input device configured to move in a rotary degree of freedom.” Neither Shahoian nor Rosenberg, alone or when combined, teach or suggest all of the limitations of claim 1. Thus, claim 1 is patentable over Shahoian in view of Rosenberg.

Shahoian describes an actuator coupled to a rectangular touchpad, such as one used in a laptop. *See Shahoian, Abstract and Figure 1*. Specifically, Shahoian describes touchpads as “small rectangular, planar pads provided near the keyboard of the computer.” *See Paragraph 5*. The actuator is configured to move the rectangular touchpad laterally in x and y directions to provide a haptic sensation to the user. *See Abstract, Paragraph 128-9*.

Shahoian does not teach or disclose a touchpad configured to rotate or move in a rotary degree of freedom. Rather, it appears the Office Action equates linear movement of the rectangular touchpad of Shahoian with rotational movement. On page 2 of the May 17, 2007 *Office Action*, the Examiner argues that “a rotational force at any point is a combination of X and Y forces.” Later, the Examiner argues: “forces provided to the touchpad as a combination of X and Y forces could be perceived by a user as rotational forces.” However, merely combining movement in the X and Y direction to instantaneously simulate a force in two directions does not teach or suggest a device configured to move “in a rotary degree of freedom.” The combination of x and y forces argued by the examiner are linear, translational forces. Linear, translational forces or movements do not teach or suggest rotational movement. Thus, Shahoian does not teach or suggest “a touch-sensitive input device configured to move in a rotary degree of freedom” as is claimed in claims 1, 14, and 17. Rosenberg fails to cure this deficiency.

The Examiner, relying on Rosenberg, asserts “the teachings of Rosenberg are provided to show that force feedback to rotating bodies is known and understood in the art.” *See Office Action*, Page 2. Specifically, the Examiner asserts that “[t]he teachings of Rosenberg provide

types of rotational feedback that could be provided to *any* input device able to be in a rotating manner.” *See Office Action*. Page 4. (Emphasis Added). Applicant disagrees.

Rosenberg teaches a wheel input device, wherein the user rotates the wheel to provide an input signal. As the Examiner acknowledges on Page 4 of the *Office Action*, the mouse wheel of Rosenberg “is not a touch-sensitive device.” Rather, the Rosenberg wheel input device is a dial, or a rotary knob. Providing a rotational force to a dial or rotary knob does not teach or suggest providing a rotational force to a “touch-sensitive input device configured to move in a rotary degree of freedom” as recited in claims 1, 14, and 17. Therefore, claims 1, 14, and 17 are patentable over the combination of Shahoian and Rosenberg.

Because claims 2-13, 15-16, and 18-19 depend from and further limit claims 1, 14, and 17, claims 2-13, 15-16, and 18-19 are each patentable over Shahoian in view of Rosenberg for at least the same reason. Applicant respectfully requests the rejections of claims 2-13, 15-16, and 18-19 be reversed.

Conclusion

In view of the foregoing, it is submitted that the rejection of claims 1-19 is improper and should not be sustained. Therefore, a reversal of the Final rejection is respectfully requested.

Respectfully submitted,

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Christopher Bosken
Reg. No. 58,887

KILPATRICK STOCKTON LLP
1001 West Fourth Street
Winston-Salem, NC 27101
(336) 607-7366 (voice)
(336) 734-2600 (fax)

Appendix A – Claims

1. A system comprising:
a touch-sensitive input device configured to move in a rotary degree of freedom; and
an actuator configured to produce a rotational force on the touch-sensitive input device.

2. The system of claim 1, wherein the touch-sensitive input device comprises a touchpad.

3. The system of claim 2, wherein the touchpad comprises a generally circular touchpad.

4. The system of claim 1, further comprising means for limiting the rotary degree of freedom.

5. The system of claim 1, wherein the touch-sensitive input device further comprises a magnet, and wherein the actuator comprises a magnetic core.

6. The system of claim 5, wherein the magnetic core comprises an E-core.

7. The system of claim 1, wherein the actuator comprises:
a motor; and
a drive belt driven by said motor and configured to produce the rotational force on the touch-sensitive input device.

8. The system of claim 7, wherein the motor further comprises a pair of end stops to limit the rotation of the motor.
9. The system of claim 1, wherein the actuator comprises:
 - a motor; and
 - an eccentric rotating mass configured to impart a vibration on the touch-sensitive input device.
10. The system of claim 1, wherein the actuator comprises:
 - a motor; and
 - a flexure driven by said motor and configured to produce the rotational force on the touch-sensitive input device.
11. The system of claim 10, wherein the flexure comprises brass.
12. The system of claim 1, further comprising a housing, wherein the actuator is grounded to the housing.
13. The system of claim 1, further comprising a processor configured to receive an output signal from the touch-sensitive input device and generate an input signal operable to cause the actuator to produce the rotational force.
14. A method comprising:

receiving an input signal; and
generating an output signal in response to the input signal, the output signal configured to cause a rotational force on a touch-sensitive input device configured to move in a rotary degree of freedom.

15. The method of claim 14, wherein generating the rotational force comprises generating a rotational force within a limited range of motion.

16. The method of claim 14, wherein the rotational force is configured to impart a pop sensation on the touch-sensitive input device.

17. A computer-readable medium on which is encoded processor-executable program code, the computer-readable medium comprising:

program code for receiving an input signal; and
program code for generating an output signal in response to the input signal, the output signal configured to cause a rotational force on a touch-sensitive input device configured to move in a rotary degree of freedom.

18. The computer-readable medium of claim 17, wherein the program code for generating the rotational force comprises program code for generating a rotational force within a limited range of motion.

19. The computer-readable medium of claim 17, wherein the rotational force is configured to impart a pop sensation on the touch-sensitive input device.

Appendix B – Evidence

None.

Appendix C – Related Proceedings

None.